Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Office of Engineering and Technology and	)	GN Docket No. 19-128
Wireless Telecommunications Bureau Seek	)	
Comment on Bidirectional Sharing Pursuant	)	
to Ray Baum's Act of 2018	)	

REPLY COMMENTS OF ELEFANTE GROUP, INC.

Elefante Group, Inc. ("Elefante Group"),[1] by its undersigned counsel, hereby submits its reply comments in the above-captioned proceeding in which the Commission seeks input regarding bidirectional sharing as it, in collaboration with the National Telecommunications and Information Administration ("NTIA"), "conduct[s] a bidirectional sharing study to determine the best means of providing Federal entities flexible access to non-Federal spectrum on a shared basis" and develops a report to Congress concerning the results of such study, as directed by RAY BAUM'S Act of 2018.[2]

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[1] Elefante Group aspires to disrupt the nation's communications and sensing marketplaces by deploying persistent near-space lighter-than-air platforms to provide Stratospheric Based Communications Services ("SBCS") within the fixed services. Using SBCS, Elefante Group plans to provide wholesale backhaul, enterprise WAN, and end-user broadband service to consumers and businesses in urban and rural areas. Elefante Group's SBCS will also provide monitoring, tracking, and sensing solutions tens to a thousand times closer than satellites. To provide these services and benefits, SBCS will need access to spectrum. Elefante Group has invested tens of millions of dollars in systems incorporating compatibility by design and seeks access, in a petition pending before the Commission, to key spectrum bands that it proposes to use under sharing regimes with incumbent users. *See Petition to Modify Parts 2 and 101 of the Commission's Rules to Enable Timely Deployment of Fixed Stratospheric-Based Communications Services in the 21.5-23.6, 25.25- 27.5, 71-76, and 81-86 GHz Bands*, Petition for Rulemaking, RM-11809, 43-45 (May 31, 2018) ("*Petition*").

[2] *See Office of Engineering and Technology and Wireless Telecommunications Bureau Seek Comment on Bidirectional Sharing Pursuant to RAY BAUM'S Act of 2018*, Public Notice, GN Dkt. No. 19-128, DA 19-371 (May 1, 2019); *see also* Repack Airwaves Yielding Better

Bidirectional sharing is not defined by the RAY BAUM's Act or the public notice, beyond the suggestion that it involves providing Federal entities flexible access to non-Federal spectrum on a shared basis. In the initial comments filed by eight entities, such sharing is characterized in a variety of ways, but it is generally and commonly understood as Federal user access to non-Federal user occupied spectrum. Within this ambit, the commenters consider everything from a Federal entity purchasing service from the commercial licensee (rather than being a spectrum user) through true spectrum sharing arrangements among disparate operating systems.

Several commenters responded to the Commission's Public Notice by putting the issue of sharing in a broader context, rather than a narrow focus on bidirectional sharing. Specifically, Boeing and Oceus Networks both cite to President Trump's October 25, 2018 Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future, which established as policy of the United States that the "government shall continue to look for additional opportunities to share spectrum among Federal and non-Federal entities."[3] The President directed NTIA, along with the Office of Management and Budget, the Office of Science and Technology, and the Commission, to make recommendations that will (1) "increase spectrum access for all users, including on a shared basis, through transparency of spectrum use and improved cooperation and collaboration between Federal and non-Federal spectrum stakeholders"; and (2) "build a secure, automated capability to facilitate assessments of spectrum

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Access for Users of Modern Services (RAY BAUM'S) Act of 2018, Pub. L. 115-141, § 610, 132 Stat. 1080, 1108 (2018).

[3] *Developing a Sustainable Spectrum Strategy for America's Future*, Memorandum for the Heads of Executive Departments and Agencies, 83 FR 54513, 54514 (Oct. 30, 2018) ("President's Memorandum"), https://www.govinfo.gov/content/pkg/FR-2018-10-30/pdf/2018-23839.pdf. *See* Boeing Comments at 2; Oceus Networks Comments at 9.

use and expedite coordination of shared access among Federal and non-Federal spectrum stakeholders."[4]

From this broader perspective, Elefante Group submits that the initial comments, on the whole, underscore the need for multiple approaches to sharing between Federal and non-Federal users. The bidirectional sharing frameworks as envisioned in the comments of T-Mobile, Verizon, and CTIA, among others,[5] are predicated on voluntary secondary market transactions. Bi-directional sharing frameworks predicated on voluntary transactions, standing alone, would offer Federal users little assurance that they will be able to obtain access to spectrum licensed to commercial entities on an exclusive area-wide basis. Sharing based on such voluntary models, rather than regulatory models creating a framework for sharing, hold the prospect – *not* the assurance – that Federal entities will be able to access non-Federal spectrum: Federal access would be limited to the times, locations, and standards that are dictated by non-Federal entities.[6]

In addition to sharing frameworks predicated on voluntary transactions, the Commission should ensure other sharing frameworks between Federal and non-Federal users. One such framework, which Elefante Group has espoused, involves non-exclusive licensing among co-primary users in which new entrants implement systems that incorporate compatibility by design.

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4 *President's Memorandum* at 54514-54515.

5 *See* T- Mobile Comments at 9, Verizon Comments at 3-5, CTIA Comments at 8-9, TIA Comments at 2; Federated Wireless Comments at 4-6). Verizon, for example, advocates for a bidirectional sharing regime based on an "exclusive-use commercial license framework" coupled with "negotiated secondary-market arrangements in which commercial or other non-federal licensees voluntarily offer federal entities access to non-federal spectrum on a shared basis." Verizon Comments at 2-3.

6 Notably, Oceus Networks reports that it has entered into voluntary spectrum access arrangements with non-Federal licensees and found that "such arrangements are limited in time and geography, and are difficult to negotiate." Oceus Networks Comments at 12.

Similarly, incumbent users, as they expand their existing systems would also pursue compatibility by design. Such frameworks should be based on proper analysis and, as appropriate, testing involving the interested parties. In this way, as Federal or non-Federal systems permit others into their bands, they will not be shut out from future growth or increased access. All parties will have the ability to grow their systems and innovate without being dependent on voluntary decisions of other spectrum users.[7] The net result will be a maximization of spectrum utilization. As Oceus networks explains, "[f]or a successful future where all U.S. spectrum users have adequate access, spectrum management cannot remain in a culture of rigid protectionism and exclusion. It instead must become a collaborative community built on technology and trust."[8] This is the outcome true sharing among co-primary users seeks to achieve, and it will result in predictability and certainty through two broad values: 1) collaboration and cooperation among spectrum users and 2) compatibility by design.

Collaboration and Exchange of Operational Information

While in many ways inimical to actual spectrum sharing, rather than secondary market spectrum transactions, to satisfy the Federal government's desire for bidirectional sharing, the commenters from the commercial mobile industry recognize what it takes to share. Verizon, for example, comments that that "[f]or successful bidirectional sharing to occur, any proposed

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[7] CTIA, at least in principle, recognizes that sharing must be a two-way street, noting that "[s]haring arrangements should . . . allow for both parties to continue to innovate and evolve technology choices—the sharing criteria should not be so rigid as to preclude moving to better and more efficient technology in the future." CTIA Comments at 7.

[8] Oceus Networks Comments at 11. The prospect for innovation and new services that can be achieved through access to significant amounts of spectrum on a shared basis can provide an equal if not surer path to innovation, rather than relying solely on entrenched existing operators to introduce new breakthroughs and somehow disrupt the marketplace they already exert considerable influence over.

approach must promote transparency and collaboration between agencies and the commercial sector," adding that "[t]o facilitate conversations and engagement, any bidirectional sharing framework should therefore balance interests between the Federal government and commercial sector and be based upon transparency, open dialogue, and engagement."[9] Similarly, Motorola Solutions, Inc. ("MSI") asserted that "[t]he key for success is to ensure that a transparent dialog is maintained where all spectrum stakeholders have the ability to clearly articulate their communications needs and requirements."[10] Collaboration and cooperation based on transparency and information sharing will facilitate efforts not only toward bidirectional sharing arrangements, but true sharing in any given band.

There also must be adequate mechanisms to evaluate whether, when, and how spectrum is being used by all Federal and non-Federal users in a shared band, including, to the extent feasible, mobile service operators. Sharing regimes in dynamic scenarios that take practical advantage of automated reporting of the place, frequency, and time spectrum is actually being used will maximize utilization by all. For example, there must be reasonable criteria – without unduly large buffers – for what constitutes operational use of the spectrum to determine when and where others can make use of the same band in the same geography.[11] Reasonable use criteria, once determined by a regulator with active industry input or agreed upon by the users themselves, should be incorporated into an objective automated system that incorporates

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9 CTIA Comments at 12. *Accord* TIA Comments at 6-7 (discussing the importance of improved spectrum use tracking by both Federal and non-Federal users as well as better mutual information sharing and collaboration).

10 MSI Comments at 3.

11 *Comments of Elefante Group., Inc. on the Development of a National Spectrum Strategy*, NTIA Docket No. 181130999-8999-01, 14 (Jan. 22, 2019), https://www.ntia.doc.gov/files/ntia/publications/elefante_group_ntia_nss_comments_final_1-22-19.pdf ("Elefante Group NSS Comments").

standard methodologies to assess spectrum use and dynamically assign spectrum resources to facilitate coordination of shared spectrum access. Exchange of sufficient relevant and operational system information and spectrum use data on a real- or near real-time basis, to make this happen, can be done in a way that protects mission-critical sensitive information while still advancing predictability. Other commenters in the record acknowledge the potential for sharing under these approaches.[12]

There must be adequate enforcement mechanisms in place to help ensure reliability of information exchange and predictability under the spectrum sharing framework. Enforcement should be used to prevent inaccurate information reporting and to address instances where users fail to operate consistently with the limits placed on their shared use.

Compatibility by Design

Sharing regimes enabling new co-primary entrants need not render incumbent primary users to secondary status relative to the new entrants, which often has occurred where the new entrants seek exclusive licensing status.[13] Rather, users – both incumbents, and new entrants, as

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[12] *See* Verizon Comments at 4 ("[I]n situations where federal or non-federal operations are time-limited, it may be possible for both parties to negotiate an agreement that allows shared use of non-federal spectrum under a coordination approach, such as through an interactive database or the use of sensing capabilities"). *See also* CTIA Comments at 2-3 (suggesting the need for "sharing of sensitive information between non-Federal and Federal stakeholders"). Once a sharing regime is set up, there must be continued dialog between operators in the shared band to address issues as they arise as the use of the band evolves. While new entrants should be required to demonstrate efforts to ensure compatibility with primary incumbents, ensuring continued compatibility and the success – if not the implementation of – mitigation to enable spectrum sharing are shared responsibilities that require good faith cooperation.

[13] In some pending high-profile rulemakings at the FCC, some operators seeking access to new bands have requested primary status within desired spectrum bands while pushing existing primary services to a secondary status. For example, this has been the position of major commercial proponents in the Spectrum Frontiers proceeding for the 26 GHz Band (25.25-27.5 GHz), where they seek primary access and any new deployments by primary Federal services would be relegated to unprotected secondary access.

they deploy new systems – should be encouraged where possible to build compatibility elements into their designs and deployments.[14] This may include implementation of technically feasible and economically practical operational mitigation techniques combined with spectrum resource management tools, often times built on sharing regimes among existing users that are already in place.[15] And with guidelines and service rules that are clearly laid out for shared use by all users within a band, predictability of access is improved for incumbents and new entrants alike.[16]

To facilitate compatibility by design, protection criteria should be independently developed (or developed through sufficiently wide consensus) and standardized after proper analysis and, if needed, testing.[17] In addition to voluntary transactions, which might incorporate some of these principles, but need not do so, regulatory authorities should have the resources to develop such models in bands to allow true sharing, with input from Federal and non-Federal users. The models used for compatibility should be reflected in rules that describe how licenses

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[14] In the case of certain incumbent services, such as those supporting aviation and other safety-of-life or public safety operations, a greater degree of demonstration of compatibility may be necessary before allowing new entrants in the same or adjacent spectrum.

[15] Elefante Group's SBCS architecture and operation is a case of compatibility being designed at the outset. *See Petition* at 59-60. Elefante Group recognizes that some services inherently will be able to implement mitigation techniques better than others, but all spectrum services, even passive services and commercial mobile services, should be actively encouraged to consider whether there are steps to improve their compatibility. That certain services have not been designed for compatibility to date is more a consequence of not being required to at times when spectrum seemed plentiful than having tried and demonstrating that compatibility is not possible. As Oceus observes, "[s]pectrum users find innovative ways to make the most of spectrum made available to them, even when sharing with others." Oceus Networks Comments at 13

[16] Already-deployed incumbent equipment may often not be subject to replacement or major modification (outside of normal cycles) to enhance sharing possibilities, but making sure relevant information (both technical and operational) is exchanged provides a better known RF environment for new entrants to assess compatibility and the potential for sharing frameworks.

[17] *Accord* T-Mobile Comments at 6.

can be deployed and what constitutes harmful interference, for example utilizing interference protection criteria.[18] It is necessary, too, that the methodologies be subject to improvements and future changes as knowledge and experience in any sharing framework is accumulated and as technology changes. What may prove to have been conservative assumptions – for example, initially adopted interference protection criteria – can be improved to better maximize access to and use of the spectrum by all users.[19]

The cooperation, collaboration, and compatibility by design as described above will support frameworks that will facilitate a variety of band-specific sharing arrangements and deliver as many if not more benefits to Federal users than bidirectional sharing based on voluntary transactions. Each arrangement naturally will require incorporation of a range of elements reflecting the operational characteristics of the particular mix of services in a given band that are engaged in the sharing. This is true of bidirectional sharing arrangements as well. TIA supports the establishment of general principles "that would apply across different bands," but notes that [a]ny bidirectional sharing regimes must be band-specific and avoid one-size-fits-all approaches. The technical characteristics, current allocations, missions, and market

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[18] Use of IPCs will help take away the guessing game of what constitutes harmful interference to other users while increasing certainty for all users, developers, and manufacturers in their designs of architectures, transmitters, receivers, and operational policies, as well as their resulting deployments, knowing what is required of them to ensure protection of other users. Certainty in the use of spectrum is not limited to exclusive licensing scenarios, as T-Mobile acknowledges, but can be achieved through a regulated sharing framework with stable, known, and predictable rules for sharing. *See* T-Mobile Comments at 2-4.

[19] *See* TIA Comments at 3 (supporting a technology-neutral approach where "any operations that comply with the basic requirements for power levels etc., and that have the appropriate management protocols in place, could potentially be permitted to operate in a band, whether federal or non-federal."). *See also* Elefante Group NSS Comments at 16-17.

expectations of users in any given band will differ from those in other bands."[20] Similarly, Boeing observes that "the benefits of band-specific bidirectional sharing rules [should] account for the differences between terrestrial, satellite, and other mobile systems," adding that parity among communications platforms in sharing arrangements "will spur investment and innovation in spectrum technologies."[21] True sharing under general principles tailored to specific scenarios should allow flexibility in sharing arrangements and also remove the uncertainty for Federal users who would otherwise have to rely upon the willingness of exclusive licensees.

CONCLUSION

In sum, true sharing frameworks should be made available, in addition to introducing rules permitting bidirectional sharing. Elefante Group submits that shared spectrum frameworks, properly established, are able to provide sufficient certainty to make investment risks acceptable in new technologies and deployments, and must complement licensing regimes (and by extension, bidirectional sharing) based on exclusivity if spectrum utilization and innovation is to be maximized. Elefante Group, which has incorporated compatibility by design in its stratospheric-based communications systems, has invested tens of millions of dollars in the effort. True sharing will promote innovation and maximize spectrum use among all current and potential future Federal and non-Federal users through collaboration, cooperation, compatibility by design, and many of the other principles important to incumbents and new entrants. In their report to Congress on bidirectional sharing, the Commission and NTIA should support the need

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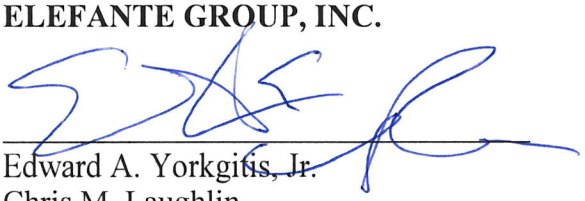
[20] TIA Comments at 3-4. CTIA also acknowledges that "[e]ach particular spectrum decision requires careful consideration of the underlying issues surrounding the use of the band. . . . [T]he circumstances and encumbrances for any spectrum band under consideration for sharing will dictate the requirements of a sharing regime." CTIA Comments at 7

[21] Boeing Comments at 3.

for true sharing frameworks as a complement to any rubric that allows bidirectional sharing based on voluntary transactions with non-Federal exclusive-use licensees.

Respectfully Submitted,

ELEFANTE GROUP, INC.



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June 17, 2019